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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,092	03/28/2001	Peter J. Sinkunas	10541/279	2537 15

29074 7590 10/02/2003

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EXAMINER	
COOKE, COLLEEN P	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-15

Office Action Summary	Application No.	Applicant(s)	
	09/820,092	SINKUNAS ET AL.	
	Examiner	Art Unit	
	Colleen P Cooke	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-19 and 21-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-23* is/are allowed.

6)☒ Claim(s) *2-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Response to Arguments

Applicant's arguments filed 7/29/03 have been fully considered but they are not persuasive.

Regarding the rejection of claim 2 as anticipated by Meyer et al. specifically, the applicant argues that Meyer et al. does not teach "the laser beam itself moves during application of beam energy to the contact being fused" on page 3. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the laser beam moves during application of beam energy to the contact being fused) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, the teachings of Meyer et al. meet the claimed limitations of simply "moving said laser beam across said flex circuits". Applicant goes on to describe what the applicant calls an "extra step" of Meyer which involves changing the direction of the laser beam and/or turning it off. It is believed that the applicant is referring to the teaching of Meyer et al. relied upon which states that once the solder paste is melted, the beam may be turned off and/or redirected. This teaching that the beam may be redirected meets the limitation of moving the laser beam as moving is broad enough to encompass the beam being redirected. Applicant further states that this supposedly teaches away from the claimed continuous movement of claim 2, however yet again it is noted that the features upon which applicant relies (i.e., that the movement of the laser beam is continuous) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988

F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As the claim does not require anything more specific than moving the laser beam, which language certainly does not exclude a change of direction per se, the teachings of Meyer et al. meet the claim.

Regarding the rejection of claims 6-15 as unpatentable over Meyer et al. in view of Ueno, the applicant merely argues that these claims are patentable because they depend from claim 2, which is patentable. Please see the response above.

Regarding the rejection of claims 16-19 as unpatentable over Meyer in view of Benko et al., applicant presents the arguments drawn to claim 2 above in addition to the argument that "there is nothing in Benko describing moving the beam during reflow". Claim 16 currently requires moving the laser beam from a point "over said contact traces to cause said solder to reflow and fuse said contract traces". Benko et al. teaches that "the solder coatings are melted and the leads 14 are soldered to bonding pads 11 by directing a laser beam 16 to impinge on a glass plate 17" which "absorbs the laser beam 16 and converts it to heat without itself becoming significantly damaged" so that the heat "is conducted to leads 14 and is sufficient to melt the solder coatings on the leads." This teaching of Benko et al. meets the claim limitations as the laser moves across the bonding pads causing reflow.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Meyer et al. (EP 0964608 A2).

With respect to claim 2, Meyer et al. teaches a soldering method including providing two circuits with at least one trace each (Column 2, lines 49-58 and also Column 4, lines 45-48), placing solder on at least one of the circuits (Column 3, lines 27-29), placing the two circuits in alignment (Column 3, lines 31-35), and using a laser beam to melt and fuse the solder (Column 3, lines 41-54). Meyer et al. teaches that the laser beam is "redirected" which would mean the beam is moving across the circuit (Column 3, lines 46-48).

With respect to claim 3, Meyer et al. teaches that the substrates have standard copper mounting pads and circuit traces (Column 4, lines 45-48).

With respect to claim 4, Meyer et al. teaches applying solder paste (Column 3, lines 26-29).

With respect to claim 5, Meyer et al. teaches using a diode laser which can have a wavelength of 400-11,000 nm, commonly 850-1000 nm (Column 4, lines 21-24) and in a specific example teaches using a wavelength of 960-980 nm (Column 4, lines 53-55).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (EP 0964608 A2) as applied to claims 2-5 above, and further in view of Ueno (6333483).

With respect to claim 6, Meyer et al. teaches the method as described with respect to claims 1-5 above. Meyer et al. is silent as to the laser beam shape. Ueno teaches reflowing solder cream with a laser, which desirably has a shape that matches that of the pad as closely as possible (Column 4, lines 39-57 and Figure 4b).

Meyer et al. and Ueno are analogous art because they are from the same field of endeavor, which is laser reflowing of solder. It would have been obvious to modify the process of Meyer et al. by using a rectangularly shaped laser beam because Ueno teaches that this is desired if the pad is rectangular.

With respect to claim 7, Meyer et al. teaches that the substrate should allow as much as 95% or more of the laser energy to pass through (Column 4, lines 5-10).

With respect to claims 8 and 9, Meyer et al. teaches that the solder paste may be deposited by any conventional means, including use of a stencil to print the paste (Column 3, lines 29-31), which would make it obvious to use a stencil between the two circuits. Also, with respect to claim 9, stenciling conventionally works to apply solder by having a solder mask that does not cover the areas to be joined, i.e. the solder paste is deposited in an area not covered by a mask.

With respect to claims 10-12, Meyer et al. teaches that the laser energy is directed to the mounting pads to melt the solder paste and join to pads with a solid solder joint (Column 3, lines 41-54).

With respect to claims 13-15, Meyer et al. teaches that several laser beams may be used simultaneously and that these beams need not all be perpendicular to the surface (see beams indicated by 70 in Figure 3).

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (EP 0964608 A2), in view of Benko et al. (5021630).

With respect to claim 16, Meyer et al. teaches a soldering method including providing two circuits with at least one trace each (Column 2, lines 49-58 and also Column 4, lines 45-48), placing solder on at least one of the circuits (Column 3, lines 27-29), placing the two circuits in alignment (Column 3, lines 31-35), and using a laser beam to melt and fuse the solder (Column 3, lines 41-54). Meyer et al. teaches that the laser beam is "redirected" which would mean the beam is moving across the circuit (Column 3, lines 46-48), but does not specifically teaches moving the beam during solder reflow.

Benko et al. teaches laser soldering where a laser is directed across a row of bond pads to join leads to the bond pads (see abstract and Column 2, lines 2-4).

Meyer et al. and Benko et al. are analogous art because they are from the same field of endeavor, which is laser soldering. It would have been obvious to modify the method of Meyer et al. by moving the laser beam across areas to be join by solder because Benko et al. demonstrates this as an art-recognized method to laser solder multiple joints efficiently.

With respect to claim 17, Meyer et al. teaches the positioning of solder balls (12) which are solder preforms (see also Column 5, lines 8-11 and Column 6, lines 9-11).

With respect to claims 18, Meyer et al. teaches that the solder may be deposited by any know printing means, which would include plating (Column 3, lines 29-31).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (EP 0964608 A2), in view of Benko et al. (5021630) as applied to claims 16 and 18 above, and further in view of Corisis (6392291).

Meyer et al. and Benko et al. teaches the reflow soldering as described with respect to claims 16 and 18 above. Meyer et al. is silent as to the use of a flux in the process.

Corisis teaches that a flux is used prior to the application of solder to a bond pad to clean off surface oxides and performs a tacking function, all of which lead to improved solder wetting and an improved bond (Column 1, lines 58-62).

Meyer et al., Benko et al., and Corisis are analogous art because they are from the same field of endeavor, which is solder reflowing. It would have been obvious to modify the process of Meyer et al. and Benko et al. by using a flux because as Corisis teaches, it improves bonding.

Allowable Subject Matter

Claims 21-23 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art or record does not teach or suggest a method of soldering plastic circuits including laminating contact traces onto each of two plastic substrates, aligning these traces, then providing a solder layer on at least one trace, position a laser relative to the substrates and directing a laser beam across the substrates to melt and fuse the traces together.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this or earlier communications from the examiner should be directed to Colleen Cooke, whose telephone number is 703-305-1136. She can normally be reached Monday-Thursday from 7:15-5:45pm.

If attempts to reach the examiner by telephone are unsuccessful, her supervisor, Thomas Dunn, can be reached at 703-308-3318. The official fax number for the organization where this application or proceeding is assigned is 703-872-9306. The unofficial fax number for this examiner is 703-746-3048.

Any inquiry of a general nature relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is 703-308-0661.

CPC 9/8/2003

TOM DUNN
SUPERVISORY PATENT EXAMINER
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